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(54) **SYSTEM AND METHOD FOR MOBILE LOCALIZATION USING FAKE LOCATION UPDATES**

SYSTEM UND VERFAHREN ZUR MOBILEN ORTUNG DURCH VERWENDUNG FALSCHER
STANDORTAKTUALISIERUNGEN

SYSTÈME ET PROCÉDÉ DE LOCALISATION MOBILE À L'AIDE DE MISES À JOUR
D'EMPLACEMENT FACTICES

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Description

BACKGROUND:

Field:

[0001] Embodiments of the invention relate to location area updating using telecommunication signaling protocols, such as, but not limited to, Random Location Area Update (LAU) and/or Random Routing Area Update (RAU).

Description of the Related Art:

[0002] Applications using technology such as Java Card, for example, can determine, through a mobile equipment - SIM (ME-SIM) interface, a visible set of base stations of a telecommunication network. Through server-side communication, these applications can provide location information on the whereabouts of the mobile equipment. Java Card refers to technology that allows Java applets to run on a SIM card. Java applets may be installed remotely to a SIM card using technology referred to as over-the-air (OTA) provisioning.

[0003] One telecommunication signalling protocol that may provide location information is Random Location Area Update (LAU). Within a Circuit Switched (CS) network, a mobile terminal may initiate LAU to refresh a location of the mobile terminal when crossing the border of two location areas. Both active and idle mobile terminals may initiate LAU.

[0004] Another telecommunication signalling protocol that may provide location information is Random Routing Area Update (RAU). RAU may be used within a packet switched (PS) network, and RAU operates in a similar manner as LAU. A mobile terminal may initiate RAU to refresh a location of the mobile terminal when crossing the border of two routing areas.

[0005] In general, signalling events communicated by the signalling protocols can be used for detecting the position of mobile terminals. Passive localization methods use signalling events without interfering with normal network operation. An example of a passive localization method is the processing of LAU or RAU events. WO 03/041031 A1 presents a solution for passive localization using LAU events.

[0006] On the other hand, active localization methods initiate message exchange with mobile terminals to obtain position information. An example of active localization is paging.

[0007] Additionally, "Tracking Vehicular Speed Variations by Warping Mobile Phone Signal Strengths" by Chandrasekaran et. al., 2011, IEEE International Conference on Pervasive Computing and Communications (PerCom), describes a solution to detect random locations by collecting signal strength information.

[0008] PCT patent application WO 03/105501 A1 discloses a method and arrangement for locating a cellular

mobile station in a cellular mobile network. The cellular mobile station(s) independently stores cellular network location information in a time dependent manner depending on a certain criteria for updating the location information. The criteria for storing the location information and the timestamp can be that the cellular mobile station moves to another cell. The location information stored in the cellular mobile station can be transmitted to the location-based services. The location criteria establish a target route, and traveling the route triggers the transmission of the location information. European patent application EP 2 028 885 A1 discloses an information system for generating presence information with regard to people visiting an area of interest. European patent application EP 2 267 980 A1 discloses a system and method for enabling proximity-triggered messaging in certain coverage areas for social networks and communities-based services.

SUMMARY:

[0009] One embodiment is directed to a method including defining mappings between coordinates of interest and fake location areas. The mapping may further include a measure of the probability that a mobile terminal is physically at a coordinate of interest or the accuracy of a location detection. The method may further include providing an application to a terminal, and distributing the mappings to the terminal. The method may further include receiving a location update generated from the terminal, wherein the location update is based upon a fake location area, and determining location information of the terminal based upon the location update.

[0010] Another embodiment may include an apparatus which may include at least one processor and at least one memory including computer program code. The at least one memory and the computer program code are configured, with the at least one processor, to cause the apparatus at least to define mappings between coordinates of interest and fake location areas, to provide an application to a terminal, to distribute the mappings to the terminal, to receive a location update generated from the terminal, wherein the location update is based upon a fake location area, and to determine location information of the terminal based upon the location update.

[0011] Another embodiment may include a computer program, embodied on a computer readable medium. The computer program may be configured to control a processor to perform a process including defining mappings between coordinates of interest and fake location areas, providing an application to a terminal, distributing the mappings to the terminal, receiving a location update generated from the terminal, wherein the location update is based upon a fake location area, and determining location information of the terminal based upon the location update.

[0012] Another embodiment is directed to an apparatus including means for defining mappings between co-

ordinates of interest and fake location areas, means for providing an application to a terminal, means for distributing the mappings to the terminal, means for receiving a location update generated from the terminal, wherein the location update is based upon a fake location area, and means for determining location information of the terminal based upon the location update.

[0013] Another embodiment may include a method including receiving, by a terminal, an application, receiving, by the terminal, mappings between coordinates of interest and fake location areas, and generating, by the terminal, a location update, wherein the location update is based upon a fake location area.

[0014] Another embodiment may include an apparatus comprising at least one processor and at least one memory including computer program code. The at least one memory and the computer program code may be configured, with the at least one processor, to cause the apparatus at least to receive an application, receive mappings between coordinates of interest and fake location areas, and generate a location update, wherein the location update is based upon a fake location area.

[0015] Another embodiment may include a computer program, embodied on a computer readable medium. The computer program may be configured to control a processor to perform a process including receiving, by a terminal, an application, receiving, by the terminal, mappings between coordinates of interest and fake location areas, and generating, by the terminal, a location update, wherein the location update is based upon a fake location area.

[0016] Another embodiment may include an apparatus including means for receiving an application, means for receiving mappings between coordinates of interest and fake location areas; and means for generating a location update, wherein the location update is based upon a fake location area.

BRIEF DESCRIPTION OF THE DRAWINGS:

[0017] For proper understanding of the invention, reference should be made to the accompanying drawings, wherein:

Fig. 1 illustrates a scenario, according to one embodiment, where location update events are generated based upon fake location areas;

Fig. 2 illustrates a scenario, according to one embodiment, where some coordinates of interest are uploaded to a terminal while other coordinates of interest are erased;

Fig. 3 illustrates, according to one embodiment, the use of real location areas as fake location areas;

Fig. 4 illustrates a flow diagram of a method according to one embodiment;

Fig. 5 illustrates an apparatus according to one embodiment;

DETAILED DESCRIPTION:

[0018] It will be readily understood that the components of the invention, as generally described and illustrated in the figures herein, may be arranged and designed in a wide variety of different configurations. Thus, the following detailed description of the embodiments of a method, an apparatus, and a computer program product for location area updating as represented in the attached figures, is not intended to limit the scope of the invention, but is merely representative of selected embodiments of the invention.

[0019] If desired, the different functions discussed below may be performed in a different order and/or concurrently with each other. Furthermore, if desired, one or more of the described functions may be optional or may be combined. As such, the following description should be considered as merely illustrative of the principles, teachings, and embodiments of this invention, and not in limitation thereof.

[0020] The use of passive localization methods to detect the position of mobile terminals may be able to provide position information for a large number of terminals. However, passive localization methods may only be able to provide position information of limited accuracy (e.g. which cell a terminal is located in) at predefined locations (i.e., position information may be provided at a time of cell change by the terminal, position information may be provided at a time of location area change by the terminal, etc.).

[0021] On the other hand, use of active localization methods to detect the position of mobile terminals may be able to give precise location information. However, active localization methods may only provide location information for a subset of terminals (all terminals cannot be polled at all times, as such polling may congest the network and/or drain terminal batteries).

[0022] Certain embodiments of the invention may provide location information without generating billable events directed to the end user. Certain embodiments of the invention may provide location information without requiring active polling/paging from a network side. Certain embodiments of the invention may provide control over the location of where an update location event is triggered. Certain embodiments of the invention may provide control over the terminals which take part in the measurements in a given location area. Certain embodiments of the invention may conserve the battery of a terminal battery, wherein a cardlet of the terminal only triggers an event when appropriate. It should be noted that advantages of the present invention are not limited to those discussed above and other advantages may be realized according to embodiments of the invention.

[0023] A user may be interested in receiving location information corresponding to a finite number of coordi-

nates (fixed or variable). For example, a transportation agency user may be interested in receiving location information corresponding to speed measurement points. As another example, a taxi cab dispatcher may be interested in receiving location information corresponding to the locations of terminals belonging to taxi drivers. These coordinates seldom coincide with cell borders or location area borders.

[0024] In view of the above, in one embodiment, a server side application may define a mapping between the coordinates of interest and "fake" location areas. Whenever the terminal detects that its location is close to one of the coordinates of interest, the terminal generates a "fake" location update. By mapping the "fake" old location area - new location area pair with the coordinates of interest, the server side application can determine the location of the terminal. In certain embodiments, the mapping may further include a measure of the probability that a terminal is physically at a coordinate of interest or the accuracy of a location detection.

[0025] As a result, the terminal does not need to send any information via SMS or GPRS, so no billable event is generated on behalf of the end user (i.e., the end user will not have to pay). Further, location information of terminals may be obtained without requiring a network to poll terminals for their positions. For example, certain embodiments of the invention may include some or all of the following steps:

- 1) In the first step, a server side application may define the coordinates of interest and attach a fake location area to each coordinate of interest (i.e., the server side application defines a mapping between the coordinates of interest and fake location areas).

[0026] For example, referring to Fig. 1, a server side application may define coordinates of interest and define mappings between the coordinates of interest and fake location areas X and Y.

[0027] Location area codes (LAC) for designating location areas may be 16 bits. Therefore, the total number of location areas may be 65535. Typically, even within large countries, an operator does not use more location areas than 1000. Therefore, an operator may safely assume that at least half of a total number of location areas can be used as "fake" location areas.

- 2) In the second step, applications may be remotely provisioned to a number of terminals. The number of terminals may depend on the application. For instance, a national transportation agency may need to remotely provision enough terminals so that the agency can determine the flow of vehicles on major roads in a country. On the other hand, a taxi dispatcher might only be interested in the location of the terminals of taxi drivers, and thus require remote provisioning of fewer terminals.

- 3) In the third step, the defined mappings (between coordinates of interest and the fake locations) are distributed to the terminals. In certain client environments, the terminal may not have enough storage for several thousands of mappings. Therefore, in some embodiments, the distribution of the mappings could be performed in an adaptive manner, as described below. In other cases, the terminal may have access to sufficient storage (e.g. Javacard 2.2.2 may allow an applet to interface with an external storage device). As such, in some embodiments, all of the mappings may be stored.

[0028] As described above, in some embodiments, the distribution of mappings could be performed in an adaptive manner. The application may update coordinates of interest corresponding to when network-side events are generated. Network-side events may include "normal" random location updates, periodic location updates, or phone-triggered location updates. A "normal" or periodic location update, for example, might be the triggering of an update of the coordinates of interest from a new location area where a terminal has just been registered. A phone-triggered location update, for example, might be the triggering of an update of the coordinates of interest from location areas that are the closest neighbours to the location area in which a phone is currently residing.

[0029] Referring to Fig. 2, in some embodiments, the storage of mappings may be kept low by uploading certain coordinates of interest while erasing other coordinates of interest. Mobile 20 may cross from location area 21 (corresponding to location area "F") to location area 19 (corresponding to location area "A"). When mobile 20 crosses the border between location area "F" and location area "A," coordinates of interest from location areas "G," "B," "C," "D," and "E" may be uploaded to a terminal. Other coordinates of interest outside of "A," "B," "C," "D," "E," "F," and "G" may be erased.

- 4) In the fourth step, the terminal may start executing measurements. A coordinate of interest may represent a physical location in a coordinate reference system. On the other hand, a measurement point may be, but is not limited to, a data set composed of many measurements taken at a location within a network infrastructure. For example, a measurement point may be a data set comprising a mobile country code, a mobile network code, a location area code, and a cell identifier. Upon gaining information during a measurement phase or from an external source, the terminal may determine whether a given measurement point corresponds to a coordinate of interest. Whenever the terminal identifies/detects a measurement point corresponding to a coordinate of interest, the terminal looks up the mapped fake location area associated with the coordinate of interest and generates a location update (LU) using parameters that indicate movement from "fake" loca-

tion area to real location area. The terminal may be kept in the current location area, without an update in home location register (HLR) or visitor location register (VLR). The mobile switching centre (MSC) may be able to detect the event (tested in lab environment).

[0030] For example, referring again to Fig. 1, a terminal may generate a location update using parameters that indicate arrival into "fake" location X (within real location area A). The terminal may also generate a location update using parameters that indicate arrival into "fake" location Y (also within real location A).

- 5) In the fifth step, the server side application creates an inverse mapping and determines the location information of the respective terminal. When events are extracted as location update events, the terminal identity will be naturally encrypted.

[0031] Fig. 4 illustrates a logic flow diagram of a method according to one embodiment. In an embodiment, the method illustrated in Fig. 4 includes, at 400, defining a mapping between coordinates of interest and fake location areas and, at 410, remotely provisioning applets to terminals. At 420, the method includes distributing the defined mappings to the terminals and, at 430, generating location updates using parameters that indicate movement of a terminal from a fake location area to a real location area. The method may also include, at 440, creating an inverse mapping to determine location information of the terminal.

[0032] If there are enough non-utilized location areas that can be used as "fake" location areas, then these non-utilized location areas may be used as "fake" location areas. However, in certain embodiments, if there are not enough non-utilized location areas for use as "fake" location areas, then the number of non-utilized location areas can be extended with a subset of the utilized location areas. For example, the number of non-utilized location areas can be extended with a subset of the utilized location areas that meet the condition that they are not the direct neighbour of the location area where the terminal is physically residing.

[0033] For example, Fig. 3 shows location areas 31, 32, and 33, corresponding to location areas "B," "H," and "A," respectively. Coordinates of interest in location area B may not use location area H as a "fake" location area because location area H neighbors location area B. However, coordinates of interest in location area B may use location area E as a "fake" location area.

[0034] As another example, coordinates of interest in location area A may use location area H as a "fake" location area because location area A does not neighbour location area H. Because location area A does not neighbour location area H, a "real" location update will not occur between A and H.

[0035] Certain other embodiments may use real and

fake location areas of other operator networks. As such, the number of available location areas may be extended.

[0036] Certain other embodiments may use routing areas as fake location areas. The use of fake location areas may generally be used with any location update protocol.

[0037] Certain other embodiments may use different triggers for generating fake location updates. For example, other embodiments may trigger by WLAN/ Bluetooth ID, trigger by sensor value (temperature values, pollution level values, acceleration values, movement values, etc), trigger by calendar events (in meeting, meeting ended, etc), trigger by phone status (in-call, idle, just sent out SMS, just received SMS, running IM client, running web browser, phone on charger, phone battery nearly depleted, phone battery charge at a certain percentage), or any other information regarding a subscriber detected directly or indirectly by a phone.

[0038] Fig. 5 illustrates an apparatus 10 according to another embodiment. In an embodiment, apparatus 10 may be a server. In other embodiments, apparatus 10 may be a terminal.

[0039] Apparatus 10 includes a processor 22 for processing information and executing instructions or operations. Processor 22 may be any type of general or specific purpose processor. While a single processor 22 is shown in Fig. 5, multiple processors may be utilized according to other embodiments. In fact, processor 22 may include one or more of general-purpose computers, special purpose computers, microprocessors, digital signal processors ("DSPs"), field-programmable gate arrays ("FPGAs"), application-specific integrated circuits ("ASICs"), and processors based on a multi-core processor architecture, as examples.

[0040] Apparatus 10 further includes a memory 14, coupled to processor 22, for storing information and instructions that may be executed by processor 22. Memory 14 may be one or more memories and of any type suitable to the local application environment, and may be implemented using any suitable volatile or nonvolatile data storage technology such as a semiconductor-based memory device, a magnetic memory device and system, an optical memory device and system, fixed memory, and removable memory. For example, memory 14 can be comprised of any combination of random access memory ("RAM"), read only memory ("ROM"), static storage such as a magnetic or optical disk, or any other type of non-transitory machine or computer readable media. The instructions stored in memory 14 may include program instructions or computer program code that, when executed by processor 22, enable the apparatus 10 to perform tasks as described herein.

[0041] Apparatus 10 may also include one or more antennas (not shown) for transmitting and receiving signals and/or data to and from apparatus 10. Apparatus 10 may further include a transceiver 28 that modulates information on to a carrier waveform for transmission by the antenna(s) and demodulates information received via the antenna(s) for further processing by other elements of

apparatus 10. In other embodiments, transceiver 28 may be capable of transmitting and receiving signals or data directly.

[0042] Processor 22 may perform functions associated with the operation of apparatus 10 including, without limitation, precoding of antenna gain/phase parameters, encoding and decoding of individual bits forming a communication message, formatting of information, and overall control of the apparatus 10, including processes related to management of communication resources.

[0043] In an embodiment, memory 14 stores software modules that provide functionality when executed by processor 22. The modules may include an operating system 15 that provides operating system functionality for apparatus 10. The memory may also store one or more functional modules 18, such as an application or program, to provide additional functionality for apparatus 10. The components of apparatus 10 may be implemented in hardware, or as any suitable combination of hardware and software.

[0044] As mentioned above, apparatus 10 may be a server. In this embodiment, apparatus 10 may be controlled by memory 14 and processor 22 to define mappings between coordinates of interest and fake location areas. Apparatus 10 may be further controlled by memory 14 and processor 22 to provide an application to a terminal. Apparatus 10 may be further controlled by memory 14 and processor 22 to distribute mappings to the terminal. Apparatus 10 may be further controlled by memory 14 and processor 22 to receive a location update generated from the terminal. In this example, the location update may be based upon a fake location area. In one embodiment, apparatus 10 is further controlled by memory 14 and processor 22 to determine location information of the terminal based upon the location update.

[0045] According to another embodiment, apparatus 10 may be a terminal. In this embodiment, apparatus 10 may be controlled by memory 14 and processor 22 to receive an application. Apparatus 10 may be further controlled by memory 14 and processor 22 to receive mappings between coordinates of interest and fake location areas. Apparatus 10 may then be further controlled by memory 14 and processor 22 to generate a location update. In this example, the location update may be based upon a fake location area.

[0046] The described features, advantages, and characteristics of the invention may be combined in any suitable manner in one or more embodiments. One skilled in the relevant art will recognize that the invention may be practiced without one or more of the specific features or advantages of a particular embodiment. In other instances, additional features and advantages may be recognized in certain embodiments that may not be present in all embodiments of the invention.

[0047] One having ordinary skill in the art will readily understand that the invention as discussed above may be practiced with steps in a different order, and/or with hardware elements in configurations which are different

than those which are disclosed. Therefore, although the invention has been described based upon these preferred embodiments, it would be apparent to those of skill in the art that certain modifications, variations, and alternative constructions would be apparent, while remaining within the scope of the invention.

Claims

1. A method comprising receiving a location update (430) generated from a terminal (10), the method further comprises:

defining mappings (400) between coordinates of interest and fake location areas, defining fake location areas as areas close to coordinates of interest;
providing an application (410) to the terminal (10);
distributing the defined mappings (400) to the terminal (10); and
determining location information (440) of the terminal (10) based upon a received location update (430),
wherein the received location update (430) is based upon one of the defined mapped fake location areas associated with the coordinates of interest.

2. The method according to claim 1, wherein the distributing of mappings (400) to the terminal (10) erases information from the terminal (10).

3. The method according to claim 1 or 2, wherein the determining of location information (440) of the terminal (10) includes creating an inverse mapping.

4. The method according to any of claims 1-3, wherein providing the application (410) to the terminal (10) is performed by remote provisioning.

5. An apparatus (10), comprising:

at least one processor (22); and
at least one memory (14) including computer program code,
the at least one memory (14) and the computer program code configured, with the at least one processor (22) to cause the apparatus (10) at least to receive a location update (430) generated from a terminal (10), the at least one processor (22) further causes the apparatus (10) to:

define mappings (400) between coordinates of interest and fake location areas, defining fake location areas as areas close to coordinates of interest;

- provide an application (410) to the terminal (10);
 distribute the defined mappings (400) to the terminal (10); and
 determine location information (440) of the terminal (10) based upon a received location update (430),
 wherein the received location update (430) is based upon one of the defined mapped fake location areas associated with the coordinates of interest.
6. The apparatus (10) according to claim 5, wherein the distributing of mappings (400) to the terminal (10) erases information from the terminal (10).
7. The apparatus (10) according to claim 5 or 6, wherein the determining of location information (440) of the terminal (10) creates an inverse mapping.
8. The apparatus (10) according to any of claims 5-7, wherein providing the application (410) to the terminal (10) is performed by remote provisioning.
9. A computer program, embodied on a computer readable medium, the computer program configured to control a processor (22) to perform a process, comprising receiving a location update (430) generated from a terminal (10), the process further comprises:
 defining mappings (400) between coordinates of interest and fake location areas, defining fake location areas as areas close to coordinates of interest;
 providing an application (410) to the terminal (10);
 distributing the defined mappings (400) to the terminal (10); and
 determining location information (440) of the terminal (10) based upon a received location update (430),
 wherein the received location update (430) is based upon one of the defined mapped fake location areas associated with the coordinates of interest.
10. A method, comprising generating, by a terminal (10), a location update (430), the method further comprises:
 receiving, by the terminal (10), an application (410); and
 receiving, by the terminal (10), defined mappings (400) between coordinates of interest and fake location areas, defining fake location areas as areas close to coordinates of interest;
 triggering the location update (430) based upon one of the defined mapped fake location areas associated with the coordinates of interest.
11. The method according to claim 10, wherein the receiving of mappings (400) by the terminal (10) erases information from the terminal (10).
12. The method according to claim 10 or 11, wherein receiving of the application (410) by the terminal (10) is performed by remote provisioning
13. An apparatus (10), comprising:
 at least one processor (22); and
 at least one memory (14) including computer program code,
 the at least one memory (14) and the computer program code configured, with the at least one processor (22) to cause the apparatus (10) at least to generate a location update (430), the processor (22) further causes receive an application (410); and
 receive defined mappings (400) between coordinates of interest and fake location areas, defining fake location areas as areas close to coordinates of interest;
 trigger the location update (430) based upon one of the defined mapped fake location areas associated with the coordinates of interest.
14. The apparatus (10) according to claim 13, wherein the receiving of mappings (400) erases information stored within the at least one memory (14).
15. The apparatus (10) according to claim 13 or 14, wherein receiving of the application (410) is performed by remote provisioning.

Patentansprüche

1. Verfahren, aufweisend das Empfangen einer Standortaktualisierung (430), die von einem Endgerät (10) erzeugt wird, wobei das Verfahren ferner aufweist:
 Definieren von Abbildungen (400) zwischen relevanten Koordinaten und falschen Standortbereichen, wobei falsche Standortbereiche als Bereiche nahe den relevanten Koordinaten definiert werden;
 Zuführen einer Anwendung (410) zum Endgerät (10);
 Verteilen der definierten Abbildungen (400) zum Endgerät (10); und
 Bestimmen von Standortinformation (440) des Endgeräts (10) basierend auf einer empfangenen Standortaktualisierung (430),
 wobei die empfangene Standortaktualisierung (430) auf einem der definierten abgebildeten falschen

- schen Standortbereiche basiert, die den relevanten Koordinaten zugeordnet sind.
2. Verfahren nach Anspruch 1, wobei das Verteilen von Abbildungen (400) zum Endgerät (10) Information aus dem Endgerät (10) löscht. 5
 3. Verfahren nach einem der Ansprüche 1 oder 2, wobei das Bestimmen von Standortinformation (440) des Endgeräts (10) das Erzeugen einer umgekehrten Abbildung enthält. 10
 4. Verfahren nach einem der Ansprüche 1 bis 3, wobei das Zuführen der Anwendung (410) zum Endgerät (10) durch Remote-Versorgung ausgeführt wird. 15
 5. Vorrichtung (10), aufweisend:
 - mindestens einen Prozessor (22); und
 - mindestens einen Speicher (14), der Computerprogrammcode enthält, 20
 - wobei der mindestens eine Speicher (14) und der Computerprogrammcode dazu konfiguriert sind, mit dem mindestens einen Prozessor (22) zu bewirken, dass die Vorrichtung (10) mindestens eine Standortaktualisierung (430) empfängt, die von einem Endgerät (10) erzeugt wird, wobei der mindestens eine Prozessor (22) ferner bewirkt, dass die Vorrichtung (10) folgendes ausführt: 25
 - Definieren von Abbildungen (400) zwischen relevanten Koordinaten und falschen Standortbereichen, wobei falsche Standortbereiche als Bereiche nahe den relevanten Koordinaten definiert werden; 30
 - Zuführen einer Anwendung (410) zum Endgerät (10);
 - Verteilen der definierten Abbildungen (400) zum Endgerät (10); und 35
 - Bestimmen von Standortinformation (440) des Endgeräts (10) basierend auf einer empfangenen Standortaktualisierung (430), 40
 - wobei die empfangene Standortaktualisierung (430) auf einem der definierten abgebildeten falschen Standortbereiche basiert, die den relevanten Koordinaten zugeordnet sind. 45
 6. Vorrichtung (10) nach Anspruch 5, wobei das Verteilen von Abbildungen (400) zum Endgerät (10) Information aus dem Endgerät (10) löscht. 50
 7. Vorrichtung (10) nach einem der Ansprüche 5 oder 6, wobei das Bestimmen von Standortinformation (440) des Endgeräts (10) das Erzeugen einer umgekehrten Abbildung enthält. 55
 8. Vorrichtung (10) nach einem der Ansprüche 5 bis 7, wobei das Zuführen der Anwendung (410) zum Endgerät (10) durch Remote-Versorgung ausgeführt wird.
 9. Computerprogramm, das auf einem maschinenlesbaren Medium verkörpert ist, wobei das Computerprogramm zum Steuern eines Prozessors (22) zum Ausführen eines Prozesses konfiguriert ist, der das Empfangen einer Standortaktualisierung (430) aufweist, die von einem Endgerät (10) erzeugt wird, wobei der Prozess ferner aufweist:
 - Definieren von Abbildungen (400) zwischen relevanten Koordinaten und falschen Standortbereichen, wobei falsche Standortbereiche als Bereiche nahe den relevanten Koordinaten definiert werden;
 - Zuführen einer Anwendung (410) zum Endgerät (10);
 - Verteilen der definierten Abbildungen (400) zum Endgerät (10); und
 - Bestimmen von Standortinformation (440) des Endgeräts (10) basierend auf einer empfangenen Standortaktualisierung (430), wobei die empfangene Standortaktualisierung (430) auf einem der definierten abgebildeten falschen Standortbereiche basiert, die den relevanten Koordinaten zugeordnet sind.
 10. Verfahren, aufweisend das Erzeugen, durch ein Endgerät (10), einer Standortaktualisierung (430), wobei das Verfahren ferner aufweist:
 - Empfangen, durch das Endgerät (10), einer Anwendung (410); und
 - Empfangen, durch das Endgerät (10), von definierten Abbildungen (400) zwischen relevanten Koordinaten und falschen Standortbereichen, wobei falsche Standortbereiche als Bereiche nahe den relevanten Koordinaten definiert werden;
 - Ansteuern der Standortaktualisierung (430) basierend auf einem der definierten abgebildeten falschen Standortbereiche, die den relevanten Koordinaten zugeordnet sind.
 11. Verfahren nach Anspruch 10, wobei das Empfangen von Abbildungen (400) durch das Endgerät (10) Information aus dem Endgerät (10) löscht.
 12. Verfahren nach einem der Ansprüche 10 oder 11, wobei das Empfangen der Anwendung (410) durch das Endgerät (10) durch Remote-Versorgung ausgeführt wird.
 13. Vorrichtung (10), aufweisend:

mindestens einen Prozessor (22); und
mindestens einen Speicher (14), der Computer-
programmcode enthält,
wobei der mindestens eine Speicher (14) und
der Computerprogrammcode dazu konfiguriert
sind, mit dem mindestens einen Prozessor (22)
zu bewirken, dass die Vorrichtung (10) mindes-
tens eine Standortaktualisierung (430) erzeugt,
wobei der mindestens eine Prozessor (22) fer-
ner folgendes bewirkt:

Empfangen einer Anwendung (410); und
Empfangen von definierten Abbildungen
(400) zwischen relevanten Koordinaten und
falschen Standortbereichen, wobei falsche
Standortbereiche als Bereiche nahe den re-
levanten Koordinaten definiert werden;
Ansteuern der Standortaktualisierung (430)
basierend auf einem der definierten abge-
bildeten falschen Standortbereiche, die den
relevanten Koordinaten zugeordnet sind.

14. Vorrichtung (10) nach Anspruch 13, wobei das Emp-
fangen von Abbildungen (400) Information löscht,
die im mindestens einen Speicher (14) gespeichert
ist.

15. Vorrichtung (10) nach einem der Ansprüche 13 oder
14, wobei das Empfangen der Anwendung (410)
durch Remote-Versorgung ausgeführt wird.

Revendications

1. Procédé comprenant la réception d'une mise à jour
de localisation (430) qui est générée depuis un ter-
minal (10), le procédé comprenant en outre :

la définition de cartographies (400) entre des
coordonnées d'intérêt et des zones de localisa-
tion factices ;
la définition de zones de localisation factices en
tant que zones proches de coordonnées
d'intérêt ;
la fourniture d'une application (410) au terminal
(10) ;
la distribution des cartographies définies (400)
sur le terminal (10) ; et
la détermination d'une information de localisa-
tion (440) du terminal (10) sur la base d'une mise
à jour de localisation reçue (430), dans lequel
la mise à jour de localisation reçue (430) est
basée sur l'une des zones de localisation facti-
ces cartographiées définies qui sont associées
aux coordonnées d'intérêt.

2. Procédé selon la revendication 1, dans lequel la dis-
tribution de cartographies (400) sur le terminal (10)

efface l'information au niveau du terminal (10).

3. Procédé selon la revendication 1 ou 2, dans lequel
la détermination d'une information de localisation
(440) du terminal (10) inclut la création d'une carto-
graphie inverse.

4. Procédé selon l'une quelconque des revendications
1 à 3, dans lequel la fourniture de l'application (410)
au terminal (10) est réalisée au moyen d'une pres-
tation de fourniture à distance.

5. Appareil (10), comprenant :

au moins un processeur (22) ; et
au moins une mémoire (14) qui inclut un code
de programme informatique ;
l'au moins une mémoire (14) et le code de pro-
gramme informatique étant configurés, à l'aide
de l'au moins un processeur (22), de manière à
ce qu'ils forcent l'appareil (10) au moins à rece-
voir une mise à jour de localisation (430) qui est
générée depuis un terminal (10), l'au moins un
processeur (22) forçant en outre l'appareil (10)
à réaliser les actions qui suivent :

la définition de cartographies (400) entre
des coordonnées d'intérêt et des zones de
localisation factices ;
la définition de zones de localisation facti-
ces en tant que zones proches de coordon-
nées d'intérêt ;
la fourniture d'une application (410) au ter-
minal (10) ;
la distribution des cartographies définies
(400) sur le terminal (10) ; et
la détermination d'une information de loca-
lisation (440) du terminal (10) sur la base
d'une mise à jour de localisation reçue
(430), dans lequel la mise à jour de locali-
sation reçue (430) est basée sur l'une des
zones de localisation factices carto-
graphiées définies qui sont associées aux
coordonnées d'intérêt.

6. Appareil (10) selon la revendication 5, dans lequel
la distribution de cartographies (400) sur le terminal
(10) efface l'information au niveau du terminal (10).

7. Appareil (10) selon la revendication 5 ou 6, dans
lequel la détermination d'une information de locali-
sation (440) du terminal (10) crée une cartographie
inverse.

8. Appareil (10) selon l'une quelconque des revendica-
tions 5 à 7, dans lequel la fourniture de l'application
(410) au terminal (10) est réalisée au moyen d'une
prestation de fourniture à distance.

9. Programme informatique, mis en oeuvre sur un support lisible par ordinateur, le programme informatique étant configuré de manière à ce qu'il commande un processeur (22) pour qu'il réalise un processus qui comprend la réception d'une mise à jour de localisation (430) qui est générée depuis un terminal (10), le processus comprenant en outre les actions qui suivent :
- la définition de cartographies (400) entre des coordonnées d'intérêt et des zones de localisation factices ;
 - la définition de zones de localisation factices en tant que zones proches de coordonnées d'intérêt ;
 - la fourniture d'une application (410) au terminal (10) ;
 - la distribution des cartographies définies (400) sur le terminal (10) ; et
 - la détermination d'une information de localisation (440) du terminal (10) sur la base d'une mise à jour de localisation reçue (430), dans lequel la mise à jour de localisation reçue (430) est basée sur l'une des zones de localisation factices cartographiées définies qui sont associées aux coordonnées d'intérêt.
10. Procédé, comprenant la génération, par un terminal (10), d'une mise à jour de localisation (430), le procédé comprenant en outre :
- la réception, par le terminal (10), d'une application (410) ; et
 - la réception, par le terminal (10), de cartographies définies (400) entre des coordonnées d'intérêt et des zones de localisation factices ;
 - la définition de zones de localisation factices en tant que zones proches de coordonnées d'intérêt ; et
 - le déclenchement de la mise à jour de localisation (430) sur la base de l'une des zones de localisation factices cartographiées définies qui sont associées aux coordonnées d'intérêt.
11. Procédé selon la revendication 10, dans lequel la réception de cartographies (400) par le terminal (10) efface l'information au niveau du terminal (10).
12. Procédé selon la revendication 10 ou 11, dans lequel la réception de l'application (410) par le terminal (10) est réalisée au moyen d'une prestation de fourniture à distance.
13. Appareil (10), comprenant :
- au moins un processeur (22) ; et
 - au moins une mémoire (14) qui inclut un code de programme informatique ;

l'au moins une mémoire (14) et le code de programme informatique étant configurés, à l'aide de l'au moins un processeur (22), de manière à ce qu'ils forcent l'appareil (10) au moins à générer une mise à jour de localisation (430), le processeur (22) forçant en outre l'appareil (10) à réaliser les actions qui suivent :

- la réception d'une application (410) ;
- la réception de cartographies définies (400) entre des coordonnées d'intérêt et des zones de localisation factices ;
- la définition de zones de localisation factices en tant que zones proches de coordonnées d'intérêt ; et
- le déclenchement de la mise à jour de localisation (430) sur la base de l'une des zones de localisation factices cartographiées définies qui sont associées aux coordonnées d'intérêt.

14. Appareil (10) selon la revendication 13, dans lequel la réception de cartographies (400) efface l'information qui est stockée à l'intérieur de l'au moins une mémoire (14).

15. Appareil (10) selon la revendication 13 ou 14, dans lequel la réception de l'application (410) par le terminal (10) est réalisée au moyen d'une prestation de fourniture à distance.

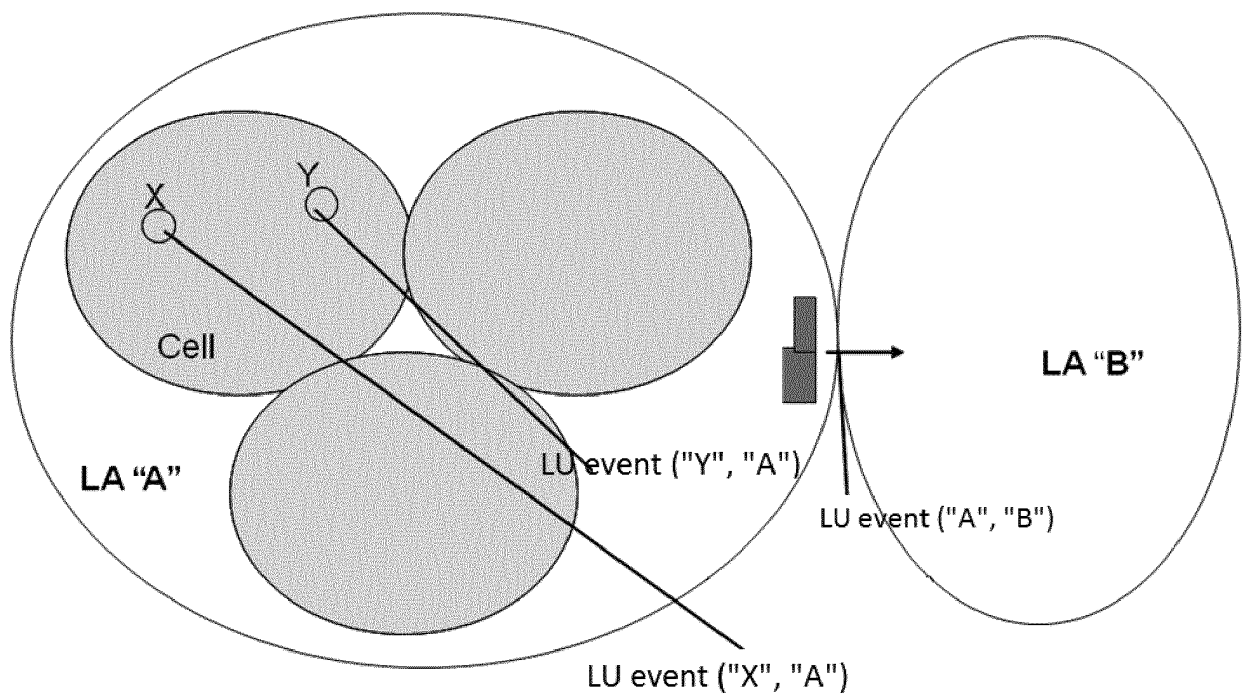


Fig. 1

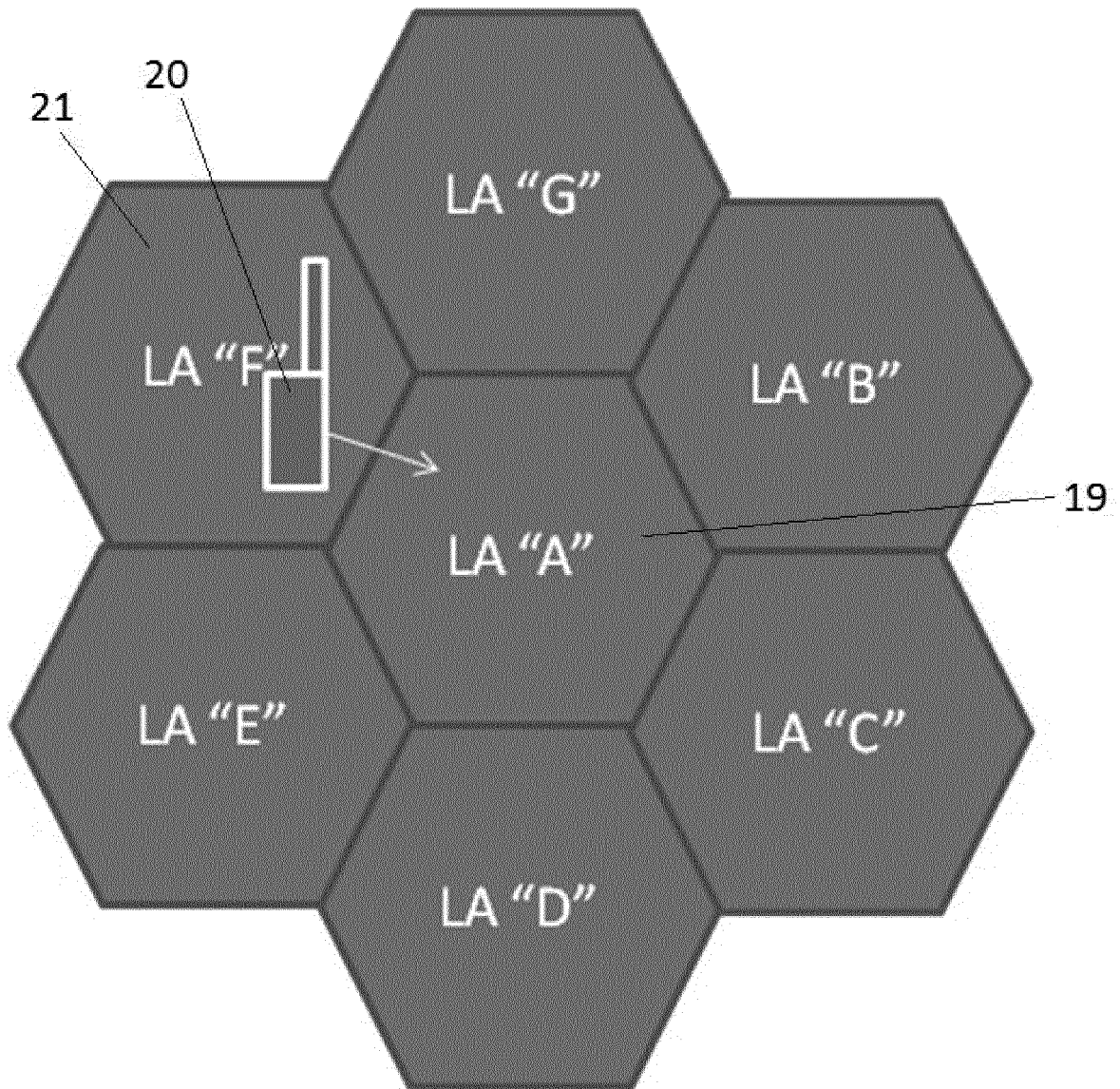


Fig. 2

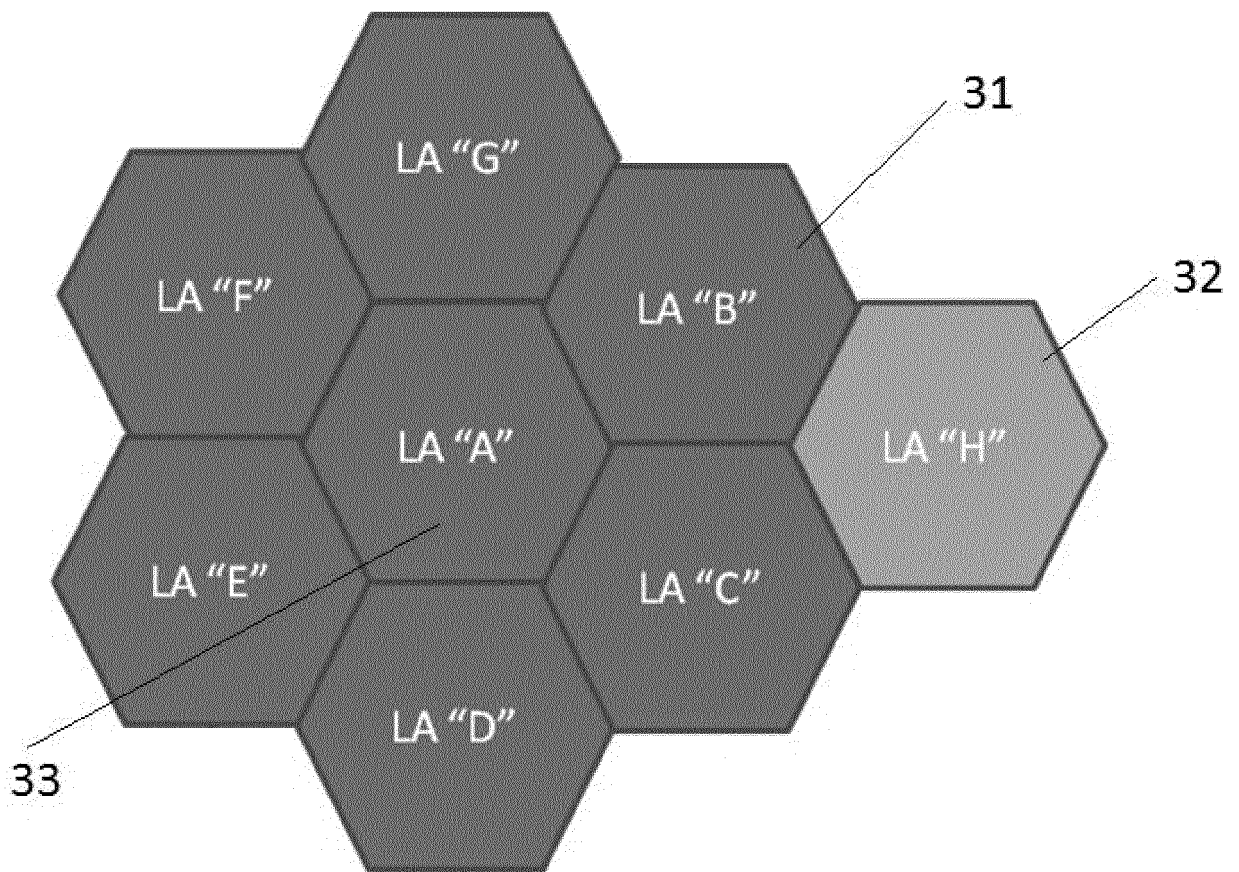


Fig. 3

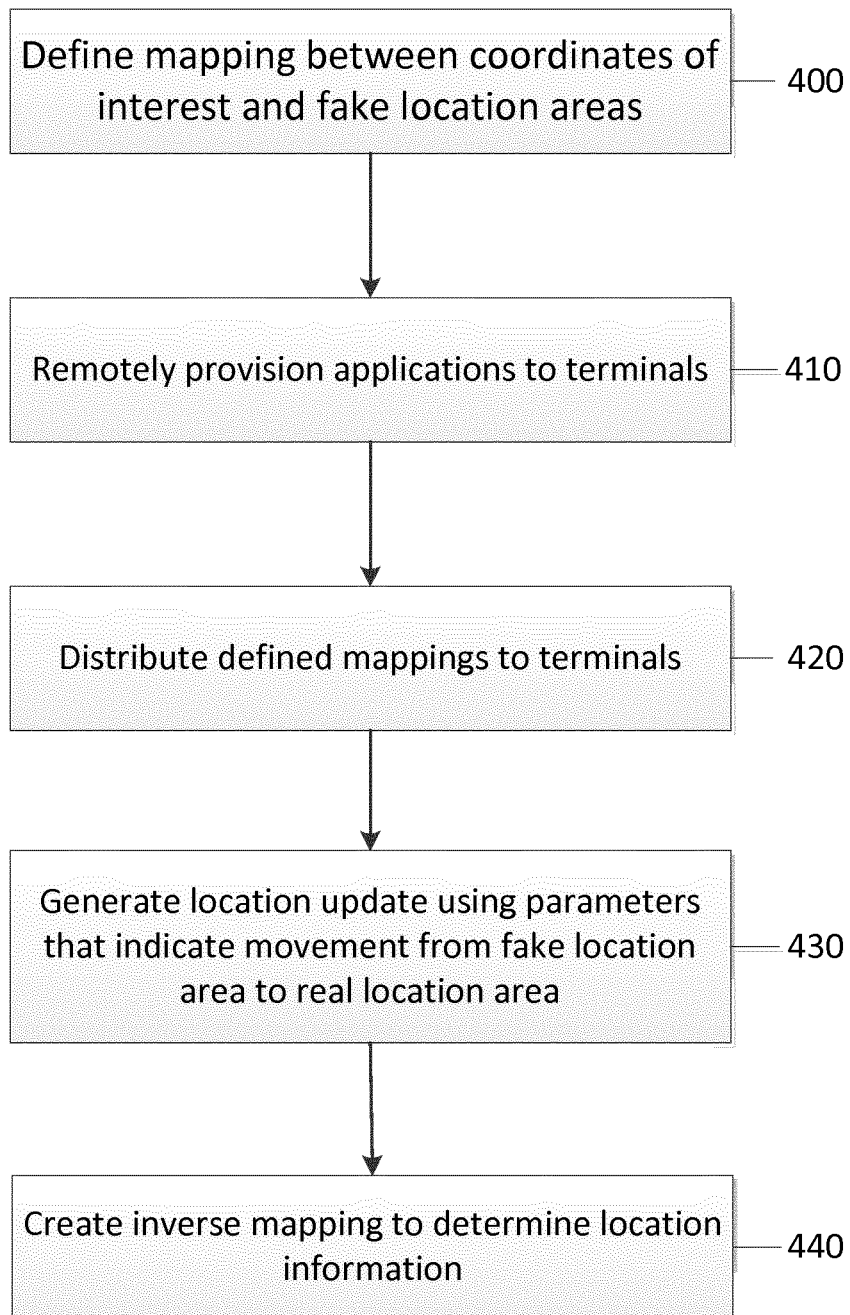


Fig. 4

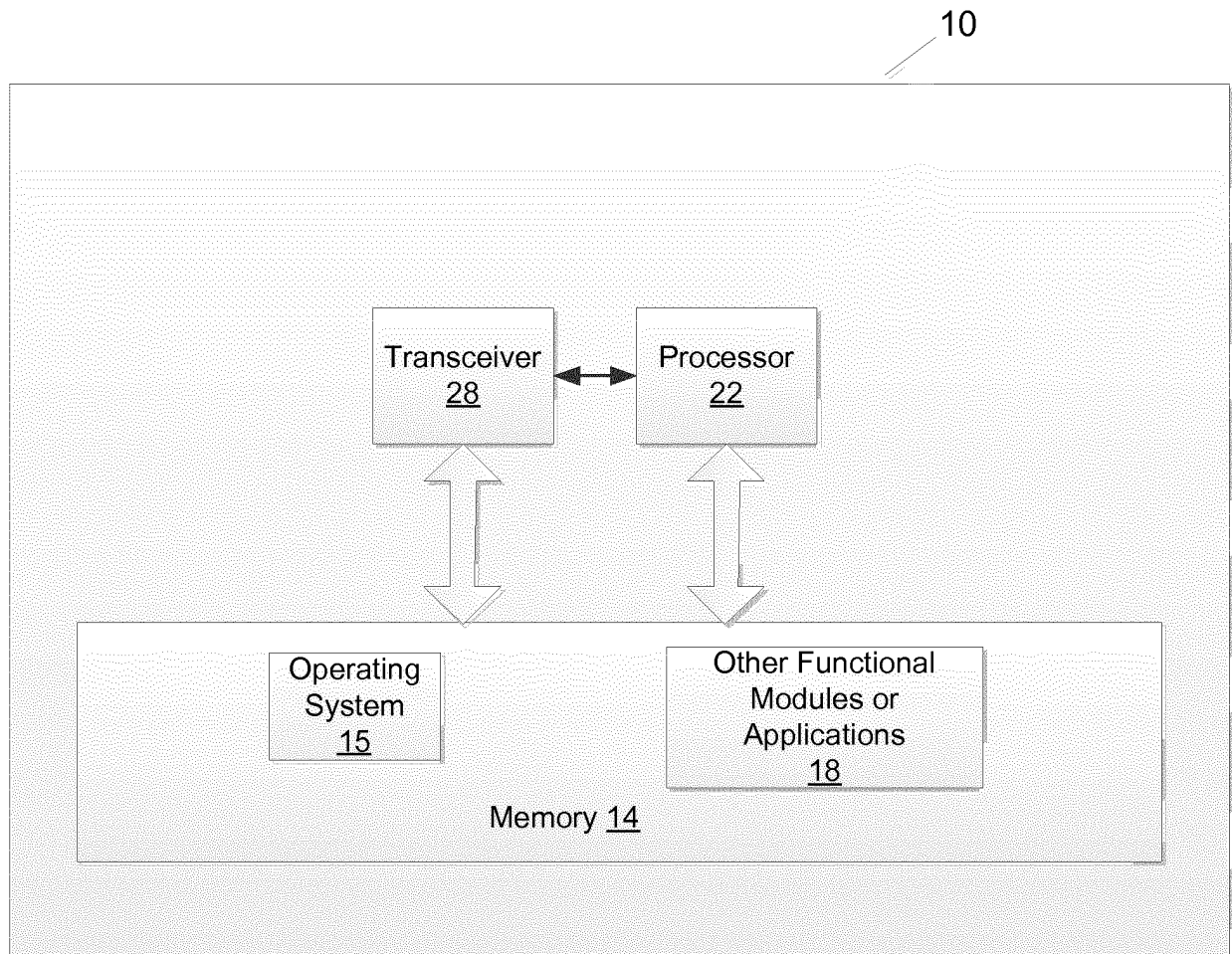


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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